THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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Plant Industry Station — Beltsville, Maryland
Volume 31 — June 15, 1947 — Number 6

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TOMATO RACE OF LATE BLIGHT OVERWINTERING ON POTATO TUBERS IN PENNSYLVANIA

W. R. Mills

In order to determine if the tomato strain of Phytophthora infestans is living over on potato tubers and also to determine the relative amounts of the potato and tomato strains, blight-infected potato tubers were obtained from 9 Pennsylvania Counties. From these potatoes 25 isolates were made of which 13 were of the tomato race and 12 of the potato race.

Results by Counties are as follows:

Warren County (Northwest): Few tomatoes grown. One tuber isolate; potato race.

Potter County (North-central): Few tomatoes grown. Important potato seed county. Two isolates from two fields, 10 miles apart. Both isolates potato race.

Sullivan County (Northeast): Few tomatoes grown. Two isolates; both potato race.

Centre County (Central): Tomatoes and potatoes grown. Seven isolates from seven fields, all seven were the tomato race.

Berks County (Southeast): Tomatoes and potatoes grown. Eight isolates, 4 tubers from each of two fields. Four isolates of the tomato race, four of the potato, with each race represented in each field.

Lancaster County (Southeast): Tomatoes and potatoes grown. One isolate; tomato race.

York County (South-central): Tomatoes and potatoes grown. One isolate; tomato race.

Somerset County (Southwest): High evelation, mostly potatoes grown. Two tubers from one field; potato race.

Allegheny County (Southwest): Tomatoes and potatoes grown; one isolate; potato race.

PENNSYLVANIA STATE COLLEGE, STATE COLLEGE, PENNSYLVANIA

EARLY REPORTS OF DESTRUCTIVE ATTACKS OF LATE BLIGHT ON TOMATOES IN ENGLAND

H. A. Allard

The destructive attack of late blight of potatoes (Phytophthora infestans) on tomatoes throughout much of the eastern United States in 1946 was most disconcerting to gardeners and growers. It has been estimated that there was a loss of 40 million dollars as a result of the disease on tomatoes during this year.

It is of interest that most destructive outbreaks of this disease on tomatoes have been experienced in other parts of the world as well. The Gardeners' Chronicle, Vol. X (new series), Sept. 14, 1878, p. 343, under the title "Out-door Tomatoes," gives an account of a great epidemic that occurred in England in 1878. The entire commercial and garden crop of this plant was almost completely destroyed. Quoting: "A more general failure of outdoor tomatoes perhaps was never seen than this year greets the eyes of growers." It is stated that only a few plants on warm walls escaped. Acres of tomatoes were destroyed before a ripe fruit was secured, although the plants were staked and tied. The loss was practically complete.

In the same source for August 24, 1878, p. 250, "A. D." mentions the occurrence of potato late blight on the stems and leaves of tomato, which were blackened and the young green fruit rotted. It is further stated that this potato blight is nothing new on tomatoes, but is favored by seasonal and weather conditions.

On page 537, Oct. 26, 1878 of the Gardeners' Chronicle, "T. C. F." discusses the great damage of this blight on tomatoes. In the summer of 1875 the disease was very destructive. In 1876 following, there was a good crop of tomatoes, but in 1878 the blight appeared again and was very bad. "C. T. F." reports that the disease in this year made its appearance on his tomatoes August 29, 30, 31, when the weather was close, warm and stormy. By September 1, it appeared as if fire had struck the plants, some on the west wall escaping, but there was noticeable improvement as the weather became drier.

It is evident that late blight of tomatoes depends upon the character of the season, and a heavy attack one year does not necessarily presage heavy attacks the year following. This at least is of some consolation to gardeners and growers.

ARLINGTON, VIRGINIA

PROGRESS REPORT ON LATE BLIGHT

FLORIDA: Late blight of potato and tomato has made little or no progress during the last month. The sudden onset of warm weather early in April appears to have been responsible for checking its development and spread in areas where it was present during February and March. Heavy rains and cooler weather about the middle of April stimulated revival of activity, but this was checked in turn by lack of rain and warm weather.

No reports have been received of the appearance of late blight on spring plantings of tomato in the central and northern part of the State. -- W. B. Tisdale, Florida Agricultural Experiment Station, Gainesville. May 8

LOUISIANA: Potatoes -- (April 28) The commercial potato growing areas in Lafourche and Terrebonne Parishes were observed for the occurrence of late blight on April 11. At this time only a trace of infection was observed in most fields visited. Since this time weather conditions have been very favorable for blight development and spread. On April 28 the area was again visited by L. H. Person and a general epidemic of late blight was observed to have developed. All fields are from moderately to severely infected with many fields killed to the ground. Some growers are plowing up fields and planting other crops. Some growers are digging and yields of 40 to 50 percent of their average normal yields are being obtained. It is estimated by the county agent in Terrebonne Parish that the yield for the parish will not exceed 25 percent of a normal crop, and at this time this seems to be a liberal estimate.

In Lafourche Parish the disease is also widespread but not quite as severe as in Terrebonne; however, the potatoes are from 2 to 3 weeks late and if the weather remains favorable for blight development losses will be as great as in Terrebonne Parish.

A spraying and dusting demonstration in Lafourche Parish has shown that the disease can be controlled when weather conditions are favorable for its development.

(May 8) For the past ten days weather conditions have been unfavorable for development of the disease. Temperatures have been relatively high with no rainfall.

In Terrebonne Parish where the disease was first noted a very severe epidemic of blight has developed. On May 8 in all fields that were observed the plants were killed to the ground with no green foliage or stems evident. Many late fields had been plowed up with a total loss. Many growers were digging with yields of 20 to 50 percent of normal yields. The average crop for the parish is conservatively

estimated at 25 to 30 percent of a normal yield. In some fields where the disease was first observed the tubers were beginning to rot.

In Lafourche Parish, blight is widespread and severe but apparently not quite as severe as in Terrebonne Parish. Losses will be serious and yields from digging indicate that losses will range from 60 to 65 percent.

The disease appeared somewhat later in Pointe Coupee Parish and some losses will occur in unsprayed fields; however, losses will be much less than in Terrebonne and Lafourche Parishes. A number of growers in this Parish were equipped for spraying and have done a good job in controlling the blight. The losses from blight in the fields where good control measures have been practiced will be negligible.

On May 1, late blight was reported by the extension horticulturist to be generally scattered over St. James Parish. Severity was reported as light to moderate. No further observations have been made in this Parish; however, the spread should be somewhat checked as conditions have been unfavorable for its development.

Tomatoes -- (April 28) Late blight was first observed on tomatoes on April 28 in Plaquemines Parish. Three fields were visited by A. G. Plakidas and blight was found in every field. In the most severely infected field the foliage was killed on the lower half of the plants. This field consisted of about 4 acres and the plants were approximately 2 feet tall and had set 2 clusters of fruit. A trace of blight was also found in experimental plots at Baton Rouge. The county agent in Lafourche Parish also reported blight on tomatoes on April 28. -- C. W. Edgerton, Louisiana Agricultural Experiment Station, Baton Rouge.

POTATO LATE BLIGHT IN MISSISSIPPI: Late blight of potatoes has been observed in two garden patches in the vicinity of Crystal Springs (Copiah County) this week. The disease is just beginning to show up on lower leaves and apparently has not spread to nearby tomatoes. An effort was made to determine the origin of the seed potatoes but the certification tag had been thrown away and no other record had been kept.

Thus far, no other reports have been sent in to the writer, nor has he seen the disease elsewhere. Late blight has not been found on tomatoes in the Truck area as yet, although an intensive survey was made in Copiah County about two weeks ago. Another survey is planned for next week. -- Douglas C. Bain, Truck Crops Experiment Station, Crystal Springs. May 16

ALABAMA: Cold weather in February apparently killed all surviving tomato and potato plants in Alabama. After late blight was reported as having survived the winter on tomatoes (reported January 28) it disappeared and was not found again until about the middle of April. At the present time late blight is spreading on potatoes in the southern part of Baldwin County. In a few fields the tops are practically all killed. The most severe outbreaks have been in fields that were damaged by hail. Weather conditions have been adverse for the growth of potatoes throughout the season. The rainfall has been almost twice the normal and the temperatures have been below normal. Most of the potatoes will not be harvested for another three weeks and late blight may cause some damage. Most growers are dusting with copper dust or spraying with Dithane. So far this spring late blight has not been reported in any part of Alabama outside of the Gulf Coast area. -- Coyt Wilson, Alabama Polytechnic Institute, Auburn. April 28

NO LATE BLIGHT SO FAR IN GEORGIA: Weather during the preceding two weeks has been cool and extremely dry. During the last three days it has been hot with no rain.

Thus far no late blight has been found. -- E. K. Vaughan, Division of Fruit and Vegetable Crops and Diseases, U.S. Bureau of Plant Industry, Soils, and Agricultural Engineering, Coastal Plain Experiment Station, Tifton. May 16

POTATO LATE BLIGHT IN SOUTH CARCLINA: (May 8) Potato late blight was found in the Edisto Island section of Charleston County, South Carolina, on Thursday, May 8. It was obvious from the extent of spread in the area that it had been present for at least a week, since at least one and possibly two secondary infection cycles had occurred. The extent of distribution over the county was not fully determined, but diseased leaves were found on all four of the farms visited in that general area. No blight has been found or reported outside that area. A survey of the same farms on April 29 failed to reveal any blight.

An attempt was made to determine the source of primary inoculum. The disease started along a farm road near the middle of a large field of potatoes and no positive primary source could be identified.

It is of interest to note that late blight was found for the first time in 1946 on one of the same farms on which it was found in 1947. No late blight on tomatoes has been observed.

(May 19) The spread of potato late blight in South Carolina has been at least temporarily halted by two weeks of hot dry weather. A survey, made after the initial appearance of blight was reported, revealed traces of the disease on many farms within a 20 to 25 mile radius of the area where it was first found two weeks ago. Damage is

still negligible, but the disease is established on some of the large potato farms of the State and a change in the weather might cause a substantial loss. No late blight has been found outside this restricted area.

Few tomatoes are grown within the area where blight has been found and no tomato blight has been observed. -- William M. Epps, South Carolina Truck Experiment Station, Charleston

NEGATIVE REPORT FROM NORTH CAROLINA: No late blight was found in an inspection of potato fields in the southern portion of the Coastal Plains on May 16 and 17. Soil was slightly moist to dry and weather warm and sunshine bright. Potato vines are smaller than usual for this date because of lack of moisture and cold weather during earlier periods. -- James H. Jensen, North Carolina State College, Raleigh

WEATHER NOT FAVORABLE FOR LATE BLIGHT IN THE VIRGINIA NORFOLK AREA: Weather conditions during the week beginning May 8 have not been favorable for the late blight disease to develop on the potato and tomato crops. There has been only 21 hundredths of an inch of rain during the week, which is considerably less than would be necessary for the disease to develop.

The five-day forecast issued by the Weather Bureau on May 13 indicated that only about one-half inch of rain is expected between that date and May 18.

Unless unusually heavy rains occur it is unlikely that late blight will be important in the spring and summer potato and tomato crops in 1947. Therefore it probably will not be necessary to spray or dust to control this disease.

Further notice will be given if the future weather conditions become favorable for late blight. -- Harold T. Cook, Virginia Truck Experiment Station, Norfolk. May 15

TOMATO LATE BLIGHT IN NEW JERSEY GREENHOUSE, APRIL 1947: We have made a careful study of a case of tomato late blight observed on April 25 on tomato seedlings in a small greenhouse in Burlington County.

Seedlings 3 to 6 inches high growing in flats and in pots showed late blight on the leaves and stems of approximately 5 percent of the plants. The lesions in some cases had advanced from the leaf down the petiole and into the stem. Abundant sporulation was observed on a few plants, particularly on the leaf lesions.

The source of inoculum was definitely determined. Last fall the grower brought a few tomato plants from a farm known to have had

tomato blight into the greenhouse before frost. These plants were kept in the greenhouse all winter and not removed until tomato seedlings in the same house showed blight lesions. The discarded plants, still available for examination on a rubbish pile, were examined on April 28 and found to have a number of half-grown blight-infected fruits. Most of the fruits, which were partially buried in the rubbish and in a moist condition, showed an abundance of Phytophthora spores.

We have no records as to whether the disease remained more or less latent or inconspicuous in the old plants during the winter and became active again in early spring or whether there were repeated infections throughout the winter.

All infected plants were discarded and the rest thoroughly sprayed with a copper fungicide. -- C. M. Haenseler, New Jersey Agricultural Experiment Station, New Brunswick. May 5

PROGRESS REPORT ON TOBACCO BLUE MOLD

The following reports have been transmitted through S. A. Wingard, Chairman of the Tobacco Blue Mold Reporting Committee.

GEORGIA: There has been no further blue mold damage since the April first report. A few hot days the second week in April definitely checked disease development. Except for these few days, however, the entire spring season has been cooler than normal. Mold symptoms reappeared after April 15, but the slight infections caused no damage.

Most of the flue-cured crop was set during the last half of April. Some growers have not completed transplanting. Plenty of plants are available for the remaining acreage provided growers wish to set a late crop. Conditions remain favorable for putting plants into the field. Good stands have been reported and very little re-setting has been necessary. There is now a surplus of tobacco plants in many localities.

Thus far, the season has been more favorable for late than for early tobacco. Blue mold has developed in the field on the early crop, which in some instances shows signs of premature blooming. A seasonal summary of the 1947 blue mold attack will follow. -- John G. Gaines, Division of Tobacco, Medicinal, and Special Crops, U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering, Tifton, Georgia. May 5

SOUTH CAROLINA: A survey in Marion, Horry, and Florence Counties on April 25 showed that blue mold is very active and causing severe damage in practically all untreated beds. Many untreated beds that had escaped infection up to now showed beginning stages of infection that will delay transplanting another two weeks, while treated beds are yielding ample plants to complete most of the transplanting during the last week in April. Approximately 25 percent of the observed beds are being treated with Fermate. Estimate of the County Agent in Marion County was that approximately one-half the growers in that county would have treated if Fermate had been available. Beds that are not being treated probably will not yield sufficient pullings for main settings until the second or third week in May. Weather conditions were favorable for optimum blue mold development during the week of April 13, but since that time warm weather has tended to check severity of blue mold damage in beds in open locations, but woods locations showed active blue mold in all communities. A few days of cloudy or cool weather during the next week or ten days would cause severe plant losses throughout the South Carolina area, as 75 percent of the plants are from late seedings that are still too small to withstand a severe epiphytotic. Supplies of Fermate continue short although a few small lots are being delivered to a few dealers in South Carolina. -- T. W. Graham, Division of Tobacco, Medicinal and Special Crops, U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering, Pee Dee Experiment Station, Florence. April 26

NORTH CAROLINA: As reported earlier, blue mold was first observed in Columbus County near the South Carolina border on March 3. For approximately a month following this report, temperatures were below the optimum for blue mold development. As a result the disease spread very slowly and damage was light. However, by April 7 the disease was scattered over Columbus, Brunswick, Bladen, and the southern part of Robeson, and isolated cases were found in Craven, Lenoir, and Sampson Counties.

In my report of April 15, I stated that starting April 13 we had the first optimum temperature and moisture relations of the season and that if these conditions continued throughout the week, as predicted, there might be an epiphytotic in Eastern North Carolina. Weather conditions continued favorable for blue mold for several days and the predicted epiphytotic occurred.

A survey conducted April 21-23 showed blue mold to be generally distributed over the eastern part of the State as far north as Nash County and west into lower Piedmont counties. Damage to plants at that time was varied. In counties where blue mold had been present for some time, severe damage was present in many untreated beds. In areas of new infections, damage was mainly confined to small patches in the beds.

Since April 23 we have not had extended periods of optimum weather conditions for blue mold to develop and spread rapidly. We have had periods of hot, dry conditions alternating with periods with temperatures too low for rapid development of blue mold. However, temperature and moisture relations have generally been such that blue mold had gradually spread until at present it is scattered throughout the flue-cured belts and has been reported at two locations in Yancey County of the Burley area.

At present, damage in the newly invaded areas is slight. For the past week, night temperatures have been below the optimum and heavy frosts occurred in the Upper Piedmont and Mountain (Burley) areas over the week-end.

While many growers in Eastern North Carolina have been hard hit by blue mold this year, indications are at present that sufficient plants (mostly 2-3 weeks late) for setting the normal acreage will be available. However, severe damage could yet result from blue mold attacking late plants.

Both Fermate dust and spray treatments are generally giving good control of blue mold where properly used. The disease has developed in considerable proportions in improperly treated beds. Bismuth subsalicylate spray with the alcohol spreader is giving excellent control in those cases reported to this office. Reports from several counties indicate that a number of growers have experienced severe damage to plants where Dithane D-14 has been applied as a spray. -- Howard R. Garriss, Extension Plant Pathologist, State College Station, Raleigh. May 12

VIRGINIA: Several rumors have been received reporting the presence of blue mold in Virginia. However, upon checking these beds it was found that the damage was from other causes. Blue mold has not been found in Virginia up to this date, (April 23). Tobacco plants are very small, the largest being about the size of a half-dollar. Stands are generally good; however, flea beetles are numerous and are causing considerable damage.

We have advised tobacco growers in the Eastern part of the State to start spraying with Fermate, making only one application each week until the blue mold appears in the State, and then to make two applications each week. DDT is being added for the control of flea beetles. -- S. B. Fenne, Virginia Extension Service, Blacksburg. April 28

MARYLAND: Blue mold was confirmed for the first time this year in Maryland in Charles County, on May 5. Mr. P. D. Brown, County Agent, confirmed the outbreak and reported that plants in one out of a group of four plant beds were infected. The plants

were about the size of a half-dollar. Tobacco plants throughout the tobacco growing area of this State are reported to be generally much smaller.

The weather is cool, there were numerous showers during the past week-end, and conditions are favorable for spread of the disease.

Growers have been advised to start spraying or dusting with Fermate. Fermate is scarce.

There was a previous report of the occurrence of blue mold on April 27 but the report could not be confirmed. -- Carroll E. Cox, University of Maryland, College Park. May 5

TENNESSEE: Blue mold has been found by R. H. Milton, Tobacco Specialist, in Williamson County, Tennessee, May 3. Weather has been favorable for spread of disease. Blue mold with abundant sporulation near Greeneville has just been reported by H. E. Heggestad, May 8. -- J. O. Andes, Tennessee Agricultural Experimental Station, Knoxville. May 9

KENTUCKY: Blue mold has been found in one bed in Spencer, May 10, and one in Mercer County, Kentucky. The former bed was a new site. In a spot in the bed about 3 feet across all plants were dead. The Mercer County bed was used last year. Plants are about the size of a dollar.

There is a general outbreak of wildfire in central Kentucky in beds not treated with bluestone-lime. Cold injury causing yellow buds is general. Several specimens of small yellow plants were received from over-fertilized beds. -- W.D.Valleau, Kentucky Agricultural Experiment Station, Lexington. From reports of May 10 and May 12

BLUE MOLD OF TOBACCO IN ONTARIO: The first occurrence of blue mold of tobacco has been confirmed in Ontario in the Leamington district of the Old Tobacco Belt on May 13. Symptoms were first observed by the grower on May 11, which makes it one week earlier than any previous record in Canada. It has not been possible to determine whether the case in question originated from air-borne inoculum or from overwintering oospores. The outbreak originated very close to old upright boards bounding the centre walk in the A-bed so this occurrence could have been the result of overwintering of the causal fungus. However, additional occurrences of the disease, if any, in the next week or so should furnish some evidence as to the actual origin of the outbreak. The seedlings attacked had leaves about the size of a dime and the fungus was fruiting freely on them.

Many flue and burley growers in Ontario in both the Old and New Tobacco Belts have begun spraying with Fermate--the supply of which

appears to be exhausted at the present time. Some burley growers who have flat, cotton-covered beds are preparing to use PDB. There have been numerous enquiries about Bismuth subsalicylate--500 lbs. of which has been packaged as a trial for flue growers. -- L. W. Koch

ADDITIONAL PARASITIC FUNGI ON CEREALS AND GRASSES IN WASHINGTON

Roderick Sprague

Isolations of root-invading fungi were made from the roots of Gramineae during the spring of 1947 at Pullman from collections made in Garfield, Walla Walla, Franklin, Spokane, Lincoln, Grant, Douglas, and Chelan Counties of eastern Washington. The most prevalent species was Fusarium nivale (Fr.) Ces. which causes a pink snow mold on Gramineae in most of the region. In addition to causing the winter snow scald, or mold, the fungus produced circular red-bordered leaf spots on new foliage during the very early spring. This spotting was particularly common on winter wheat in parts of the Palouse region. F. nivale was common on Bromus tectorum and was disfiguring to fescue lawns (Festuca rubra var. commutata) in Whitman and Douglas Counties. It is one of the components of the "snow mold" complex in Douglas County, together with Typhula idahoensis Remsberg and T. itoana Imai.

Pythium arrhenomanes Drechsl. was isolated from the roots of winter wheat which was growing in sandy soil in Franklin County in early March. This appears to be the first definite report of this fungus from the State, although seedling blight of grass has, in other years, been a problem in establishing nurseries at Pullman.

A partial list of the isolations, plus some miscellaneous collections, that represent additions to the flora of this State are as follows:

COLLETOTRICHUM GRAMINICOLUM (Ces.) Wils. on: Agrostis palustris Huds., Longview, Wash. (Allan MacLean, coll.)

FUSARIUM CULMORUM (W. G. Sm.) Sacc. on: Agropyron elongatum x Triticum aestivum (partially perennial), Pullman; Festuca rubra var. commutata Gaud., Pullman; Poa pratensis L., Pullman.

F. ACUMINATUM Ell. and Ev. on: Festuca octoflora Walt., Lowdon; Poa bulbosa L., Lewiston, Idaho; P. secunda Presl., Kahlotus, Dusty; Trisetum cernuum Trin., Mt. Rainier.

F. NIVALE (Fr.) Ces. on: Agropyron cristatum (L.) Gaertn., Whitman

and Douglas Counties; A. elongatum x Triticum aestivum, Pullman; A. intermedium (Host.) Beauv., Douglas County, A. repens (L.) Beauv., A. sibiricum (Willd.) Beauv., Douglas County; A. smithii Rydb., Douglas County; Agrostis palustris Huds., Pullman; Bromus carinatus Hook. and Arn., Lyle (F. sp. in earlier reports), Douglas County; B. inermis Leyss, Douglas County; B. tectorum L., general in eastern Wash., extending into Idaho (F. sp. of earlier reports); Festuca rubra var. commutata, Pullman, Waterville; Hordeum nodosum L., Douglas County, also at Lyle (F. sp. of earlier reports); H. vulgare L., Pullman; Koeleria cristata (L.) Pers., Douglas County; Phleum pratense L., Douglas County; Poa ampla Merr., Douglas County, Pullman; P. bulbosa L., Pullman; P. pratensis L., E. Wash.; P. secunda Presl, Pullman, Douglas County; Sitanion jubatum J.G.Sm., Kahlotus; Stipa columbiana var. nelsoni (Scribn.) Hitch., Douglas County; Triticum aestivum L., E. Wash., adjacent Idaho

F. POAE (Pk.) Wr. on: Festuca octoflora, Lowdon; Triticum aestivum, Franklin County.

GLOEOSPORIUM BOLLEYI Sprague on: Hordeum vulgare, Pullman; Poa pratensis, Pullman

PSEUDODISCOSIA AVENAE Sprague and A.G.Johnson on: Arrhenatherum elatius (L.) Beauv., Pullman (new host).

PHYTOPHTHORA CACTORUM (Leb. and Cohn) Schroet. on: Triticum aestivum, Dusty.

PYTHIUM ARRHENOMANES Drechs. on: Triticum aestivum, 16 miles west of La Crosse.

PYTHIUM DEBARYANUM Hesse on: Hordeum vulgare, Pullman

PYTHIUM sp. (has some of the characters of P. perniciosum Serbinow) on: Bromus tectorum, Lilargent.

RHIZOCTONIA ORYZAE Riker on: Bromus tectorum, at Washington-Idaho line, Lewiston grade, Idaho.

RHIZOCTONIA SOLANI Kuehn on: Agropyron cristatum, Pullman; Deschampsia atropurpurea (Wahl.) Scheele, Mt. Rainier; Festuca octoflora, Lowdon; F. rubra var. commutata, Pullman; Poa bulbosa, Pullman; P. cusickii, Pullman; P. secunda, Pullman

SCOLECOTRICHUM GRAMINIS Fckl. on: Deschampsia atropurpurea, Chinook Pass.

SELENOPHOMA DONACIS var. STOMATICOLA (Bauml.) Sprague and A.G.Johnson on: Deschampsia elongata (Hook.) Munro, Mt. Rainier; Elymus aristatus Merr., Chinook Pass.

S. EVERHARTII (Sacc. and Syd.) Sprague and A.G.Johnson on: Deschampsia atropurpurea, Chinook Pass.

SEPTORIA AVENAE Frank on: Arrhenatherum elatius, Pullman.

S. NODORUM Berk. on: Deschampsia atropurpurea, Chinook.; A. elongata, Mt. Rainier.

TYPHULA spp. Both T. idahoensis and T. itoana were collected on various hosts by C. S. Holton, Jack Meiners and the writer in Douglas County.

WASHINGTON STATE COLLEGE, PULLMAN

DISEASES OF WHEAT AND BARLEY AT DENTON, TEXAS, APRIL 1947

I. M. Atkins

(April 1). Below normal temperatures continued through March. The mean temperature for the month was 50.5° F., which is 5.3° below normal and brings the accumulated departure from normal since January 1 to 10.2° below normal. Temperatures of 32° F. or below were recorded on 12 days during the month. The maximum temperature for March was 79° F. on the 23d but maximum temperature exceeded 70° only six days during the month. A measurable amount of precipitation occurred on 12 days, giving a total of 2.98 inches, 0.55 inch above normal. Wind movement totaled 7,499 miles for the month, which is considerably above normal. Twenty-four hour average wind movement of near or in excess of 20 miles per hour was recorded on four days. The last killing frost occurred on March 16 about a week earlier than the average date.

Small grains made satisfactory progress during the month. Very rapid growth was made during the past two weeks. It appears now that maturity may be late and certainly later than in the very early seasons of 1945 and 1946. Spring-seeded oats, replanted soon after the January freeze, have been very slow in germinating as full stands did not emerge until near March 15. These late oats may encounter unfavorable conditions because of rust or high temperatures before they mature. Owing again to the very cool temperatures, leaf rust of wheat [Puccinia rubigo-vera var. tritici] has just made its appearance. No other rusts have been observed. There is a moderate infection of powdery mildew [Erysiphe graminis] on barley.

(April 15). Very little wheat leaf rust has developed and only a few spores are being caught on slides. Mildew infection on barley is heavy.

(April 30). Diseases have increased very rapidly during the cool weather. Wheat leaf rust has reached epidemic proportions during the past 10 days at the Station, although commercial fields are still freer from infection than usual at this time of the year. Septoria [tritici] is abundant and causing loss of lower leaves and parts of leaves. Mildew infection on wheat is the heaviest that the writer has ever seen. Mildew infection on barley also is heavy. No rust has been observed on either oats or barley in this immediate area. An unidentified leaf disease resembling stripe [probably false stripe] is prevalent on barley where it is causing destruction of many leaves or parts of leaves.

Our changeable weather continues. Throughout the month, one or two days of warm, clear weather was followed by a quick shift of the wind to the north and a day or two of cool weather often accompanied by showers. This has resulted in precipitation on 12 days of the month with a total of only 3.00 inches, 0.96 inch below normal for April. It has been sufficient for the needs of the crop but has hampered farming operations. Temperatures have been quite variable but the final mean temperature was very near average for April. The maximum of 91° F. occurred on the last day of the month, the next highest being 86° F. The minimum was 32° F. on the 17th, accompanied by a light frost.

DIVISION OF CEREAL CROPS AND DISEASES, UNITED STATES BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

REPORTS ON APPLE SCAB

POSSIBILITY OF SEVERE APPLE SCAB INFECTION IN 1947 SEASON FORECAST FOR MARYLAND: Examination of dead apple leaves from various localities in Maryland has shown an unusually heavy carry-over of the apple scab organism. In most cases every leaf examined contained many perithecia and often there were several hundred present on each leaf. Most of these perithecia appear viable when examined under the microscope. Therefore, if weather conditions are favorable during the 1947 season there will be a possibility of severe scab infection.

On the Eastern Shore and in southern Maryland some spore discharge has probably occurred but in most of western Maryland the perithecia are still immature. -- W. F. Jeffers and R. A. Jehle, University of Maryland, College Park. April 24

APPLE SCAB IN WISCONSIN: The ascospores of Venturia inaequalis in apple leaves in Dane County are mature and discharging on slides under microscope on May 4. Ascospores are just delimited in Door County. -- R. E. Vaughan, University of Wisconsin, Madison. May 5

BRIEF NOTES ON PLANT DISEASES

LEAF RUST AND OTHER DISEASES OF WHEAT IN SOUTHEASTERN COLORADO

By R. E. Atkinson

Last fall leaf rust was epiphytotic in the southeastern corner of Colorado on the winter wheat and airplane dusting with sulfur was employed to control the outbreak.

On April 16 a trip was made with E. A. Lungren, of the U. S. Bureau of Entomology and Plant Quarantine to the southeastern corner of Colorado to check up on the survival of leaf rust. Overwintering was apparently very rare as no more than a trace was observed in any field. Observations were made in Baca, Bent, Prowers, Cheyenne, and Kiowa Counties.

The most prevalent disease on winter wheat was speckled leaf blotch, Septoria tritici. Wheat mosaic [virus], both the mild and yellow, which were quite prevalent last year, were observed in only trace amounts.

COLORADO A. & M. COLLEGE, FORT COLLINS. April 23

AZALEA PETAL BLIGHT IN THE NORFOLK AREA OF VIRGINIA

By T. J. Nugent

Azalea petal blight caused by Ovulinia azaleae, has been identified for the first time (May 8, 1947) in the Norfolk, Virginia area. Typical sclerotia were formed on azalea flowers when placed in moist chambers. Flowers from numerous sources show the typical flower spots but as yet no sclerotia have been found under natural conditions. This is probably due to the unusually dry weather that is being experienced in this area at this time.

VIRGINIA TRUCK EXPERIMENT STATION, NORFOLK

SOME CORRECTIONS

SUPPLEMENT 167: On page 7, the location, Florida, for soybean target spot was omitted.

On page 11, the name of the organism causing zonate spot of corn is Gloeocercospora sorghi.

COTTON SEED TREATMENT TEST LOCATIONS: In the report by the Cotton Seedling Disease Committee in the preceding issue of the Reporter, pages 204-210, note d on page 207, and note a on pages 208 and 209 should refer to Table 2 instead of Table 1.

FORECASTING TOMATO LATE BLIGHT[1]

Harold T. Cook

Late blight forecasts will make it possible for potato and tomato growers in Eastern Virginia to delay spraying or dusting until it is evident that the disease is likely to cause severe damage. This will result in considerable saving in labor, fungicides and money by eliminating spraying or dusting in the years when late blight is unimportant. Since the forecasting method is based on the records of blight in Eastern Virginia, the forecasts will apply only to that area. However, the method or a modification of it, may be used in other areas provided there is sufficient information about the previous occurrence of blight.

The records show that late blight has seldom been important in Eastern Virginia. According to the Plant Disease Survey which covers the 30 year period from 1917 to 1947, late blight caused serious damage to the early potato crop in only two years (1938 and 1946) and to the tomato crop in only one year (1946). Also there are statements in the early numbers of the Plant Disease Survey that blight had not been serious in earlier years.

Routine spraying or dusting as insurance against a disease that occurs so seldom would not be a sound practice. The cost during non-blight years would more than offset any profit obtained in years when blight was serious. This is well illustrated by figures recently released by a neighboring state on the results of spraying tomatoes in 1946. In these tests the value of the tomato crop was increased $374.40 an acre by spraying five times at a cost of $20.00. At that rate it would have cost $600 to spray the crop every year for 30 years and the net loss would have been $225.60 not counting interest.

To make the control of late blight practical and acceptable to the growers there must be some means by which they can be warned several weeks in advance of outbreaks of blight so that they will only need to spray when the disease threatens to develop. This is made possible by the forecasting method which has been developed for Eastern Virginia.

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1 Reprinted from the FOOD PACKER, April 1947

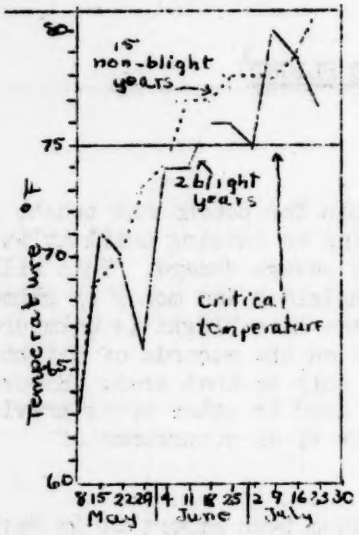


Fig. 1. Average temperature 1930-1946

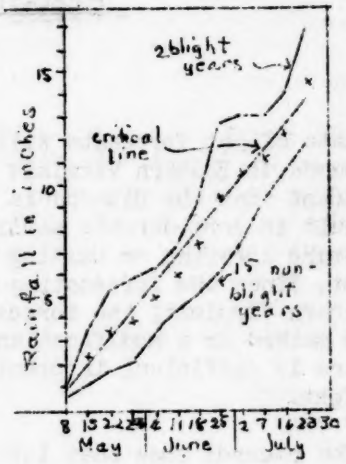


Fig. 2. Average rainfall 1930-1946

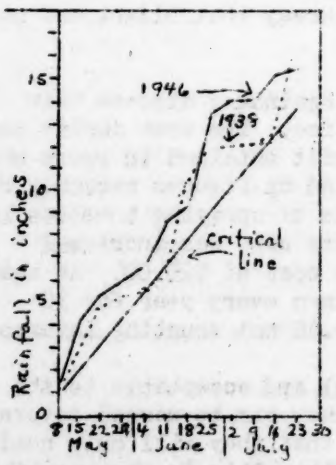


Fig. 3. Rainfall for blight years

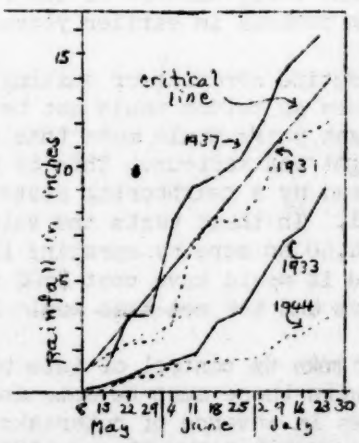


Fig. 4. Rainfall for non-blight years

The method is based on the occurrence of late blight in relation to the temperature and rainfall in May, June and July in that area during the last 17 years. The data for those months are used because the first blight is found about the 20th of May when it does occur. The initial development of the disease would depend on the weather during the preceding two weeks and its destructiveness would depend on a continuation of favorable conditions into June and possibly July. The relationship of the weather to blight and the method of making the forecasts is shown in figures 1 - 5.

The graph in figure 1 shows that the average weekly temperature (mean of the minimum and maximum) was generally lower during the two blight years than during the 15 non-blight years. It also shows that in the blight years the temperature remained below 75 degrees F. about one week longer than it did in the non-blight years. This is in agreement with the well known fact that temperatures of 75 degrees F. or higher are unfavorable for late blight infection. According to the graph, the average temperature is usually favorable for blight in Eastern Virginia in May and the first week in June and in blight years it remains favorable for a somewhat longer period.

The graph in figure 2 shows that the average cumulative rainfall beginning the second week in May was continuously greater in the 2 blight years than in the 15 non-blight years. The cumulative rainfall for each of the blight years is shown in figure 3 and for four typical non-blight years in figure 4. It will be noted that there is considerable variation in the rainfall in the non-blight years. It was considerably below the average in 1933 and 1944, but about equal to the blight years in June and July in 1937. However, the temperature records show that in 1937 the average temperature was 75 degrees F. and higher after the third week in May and that conditions were thus unfavorable for blight in spite of the high rainfall.

A gauge by which to determine when the rainfall is sufficient for blight to develop was provided by drawing a median or "critical" line on the graph in figure 2. This is a straight line drawn as nearly as possible half way between the lines for the blight and non-blight years. Whether or not the rainfall is favorable for blight is determined by plotting the rainfall of an individual year on graph paper on which the "critical" line has been marked. The rainfall may be considered favorable for blight whenever the plotted line goes above the "critical" line and unfavorable when it only touches or is below that line.

The combined effect of rainfall and temperature is shown for each of the 17 years in figure 5. Whether or not the temperatures and rainfall were favorable for blight was determined by plotting the data for each year on graph paper on which the "critical" rainfall and "critical" temperature (75 degrees F.) lines had been drawn. The

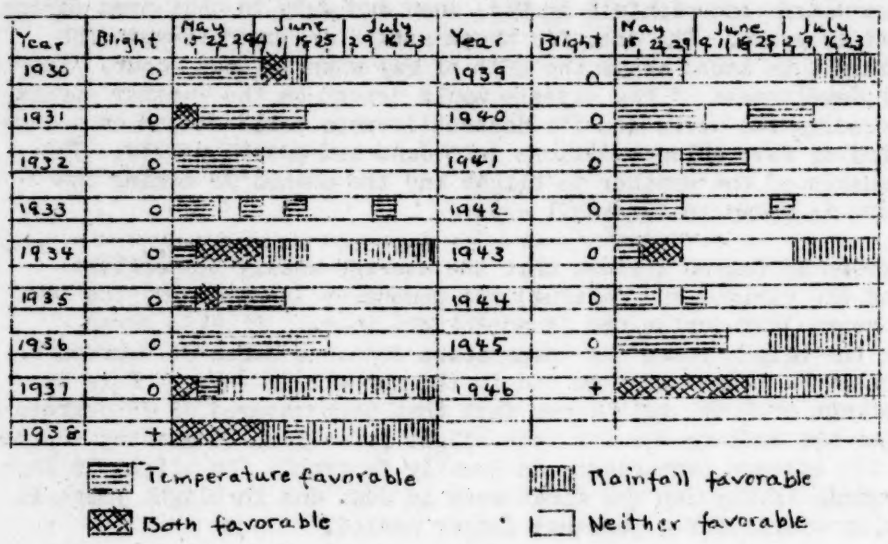


Fig. 5. Occurrence of blight in relation to temperature and rainfall 1930-1946.

periods when both the temperature and rainfall were favorable for blight are marked in solid black. It will be noted that in 1938 when blight damaged only the early potato crop, favorable weather prevailed continuously for four weeks beginning the second week in May. A trace of late blight was found in a few tomato fields early in June that year, but the disease developed no further on that crop. In 1946, when both the early potato crop and tomatoes were severely damaged, favorable weather prevailed continuously for six weeks. The longer period of favorable weather in 1946 enabled the disease to develop more extensively on tomatoes than in 1938.

No blight occurred in any of the other 15 years and it will be noted that aside from 1934 and 1943, there were no periods of more than a week that were favorable for blight. In fact, in 9 of the years there were no periods when both temperature and rainfall were favorable for blight. Apparently the three and two week favorable periods in 1934 and 1943 occurred too late and did not last long enough to start a serious outbreak of the disease.

Beginning the second week in May the forecasts will be made by plotting the average weekly temperature and cumulative rainfall at weekly intervals on graph paper on which the "critical" rainfall and temperature lines have been drawn. The results will be transferred to a chart like that in figure 5. Spraying or dusting will be recom-

mended after there have been two consecutive weeks in May when both temperature and rainfall have been favorable for blight. Recommendations to cease spraying will not be made until there have been two consecutive weeks when either temperature and/or rainfall have been unfavorable.

If the forecasting method had been available in previous years, spraying or dusting would have been recommended in 1934, 1938, 1943 and 1946. It would not have been recommended in any of the other 13 years. The only error would have been in 1934 and 1943 or in 2 out of 17 years. The predictions would have been 88 per cent correct. The errors would have been in years when spraying or dusting was recommended for safety even though it was doubtful that blight would be serious because of the late date when the weather became favorable. Nature is variable and there is always the possibility that 1947 may be entirely different from any of the 17 years on which the forecasting method is based.

Even though the forecasts will enable the growers to delay spraying or dusting until it is evident that blight is likely to cause damage, they would not delay making preparations for spraying if it becomes necessary. Good blight control will be obtained only if spraying is started immediately after the forecast that indicates blight will develop. Sprayers or dusters must be available for immediate use and there must be a sure source of enough fungicide for at least three applications.

The forecasting method may be used in other areas provided there is enough information about the dates and severity of outbreaks of blight in those areas to construct a "critical" cumulative rainfall line. With such a line it would be possible to construct a chart like figure 5, which would indicate the conditions necessary for blight in that area and would serve as a base for predicting future outbreaks.

VIRGINIA TRUCK EXPERIMENT STATION, NORFOLK

CHECK LIST REVISION

Freeman Weiss

ATROPA (SOLANACEAE)

ATROPA BELLADONNA L., BELLADONNA. Perennial herb of Europe and Asia, cultivated for the drug atropine.

Alternaria sp. (? solani (Ell. & G.Martin) Sor.) leaf spot. Calif.
Bacterium solanacearum E.F.Sm., bacterial wilt. Ga., ? Calif.
Cercospora atropae Kvashnina, leaf spot. Va.
Fusarium sp., root rot. Calif.
Heterodera marioni (Cornu) Goodey, root knot. Calif.
Mycosphaerella sp., leaf spot. Calif.
Peronospora ? hyoscyami DBy., downy mildew. Calif.
Phytophthora parasitica Dast., root rot. Calif.
Pythium spp., damping off, root rot. Calif. P. debaryanum Hesse, P. irregulare Buis., and P. ultimum Trow have been identified.
Ramularia sp., leaf spot. Calif.
Rhizoctonia solani Kuehn, damping off, root rot. Calif.
Thielaviopsis basicola (Berk. & Br.) Ferr., root rot. Calif.
Verticillium albo-atrum Reinke & Berth., wilt. Calif.

Mosaic -- undetermined virus. Calif., Fla. Susceptibility to infection by cucumber mosaic virus has been demonstrated.
Psyllid yellows -- ? feed injury by the insect Paratrioza cockerelli (Sulc.). Calif.

BROWALLIA (SOLANACEAE)

BROWALLIA spp., especially B. DEMISSA L. and B. SPECIOSA Hook. Annuals of tropical America grown in greenhouses and gardens for ornament.

Fusarium sp., wilt. Del.
Heterodera marioni (Cornu) Goodey, root knot. Md.

CAPSICUM (SOLANACEAE)

CAPSICUM FRUTESCENS L. (C. annuum L.), RED PEPPER, SWEET PEPPER. Tropical shrub, grown usually as an annual for edible fruit, in various horticultural forms as var. GROSSUM Sendt., SWEET or BELL PEPPER; var. LONGUM Sendt., LONG P. or CHILLI; and others; commercial cultivation chiefly in N.J., Fla., Calif., Tex., N.Car., and La.

Capsicum cont.

Alternaria sp., in part probably A. solani (Ell. & G.Martin) Sor., black rot of fruit, internal mold, leaf spot (early blight). General, often following sunscald and blossom-end rot. Other Alternaria spp., especially A. tenuis Nees ex Cda., may be pesent, perhaps as secondary invaders; the latter also causing seed mold.

Aphanomyces sp., seedling root rot. N.J.

Ascochyta capsici Bond.-Mont., leaf spot. Wash.

Bacterium solanacearum E.F.Sm., bacterial wilt. Pa. to Fla. and Tex.; P.R.

(B. vesicatorium Doidge): Xanthomonas vesicatoria

Botrytis cinerea Pers. ex Fr., gray mold rot. Occasional in markets, especially after cold storage. Fruit rot and stem canker in the field as reported from Calif., Conn., N.J., Pa., Wash.

Cercospora capsici Heald & Wolf, frogeye leaf spot, stem-end rot of fruit. N.Y. to Fla., Tex., and Mo.; Calif., P.R.

Choanephora cucurbitarum (Berk. & Rav.) Thaxt., blossom rot. Fla., N.Car.

Cladosporium herbarum Lk. ex Fr., velvet mold of fruit, secondary leaf spot. Calif., Ga., Tex., Wash., P.R.

Colletotrichum capsici (Syd.) Butl. & Bisby, ripe rot. Ga., Tex., P.R.

C. nigrum Ell. & Hals., fruit rot. Fla., Ga., N.J., Tex., probably general in the East and South. Has been confused with Gloeosporium piperatum (q.v.), sometimes regarded as a synonym, and reported as the cause of common anthracnose but the preponderance of evidence indicates it to be distinct and not the primary cause of this disease. This and other Colletotrichum spp., approaching C. dematium (Fr.) Grove occur as wound parasites or saprophytes on pepper pods.

Curvularia lunata (Wakk.) Boed., pod rot. Fla. Also on seed in Mich.

Cuscuta sp., dodder. Ga., N.J., Va. C. pentagona Engelm. Tex.

Diaporthe phaseolorum (Cke. & Ell.) Sacc., fruit rot. Miss., Mo. Also reported as Phomopsis capsici (Magnaghi) Sacc.

Erwinia aroideae (Town.) Holland, and E. carotovora (L.R.Jones) Holland, bacterial soft rot. Conn., Fla., La., Mich., Mo., Tex.; occasional in markets.

Fusarium spp., fruit rot, stem rot, wilt. Reported in various aspects, especially blight or wilt, from all pepper-growing districts, usually without specific identification. F. annuum Leonian (? F. vasinfectum Atk. = F. oxysporum Schlecht. f. vasinfectum (Atk.) Snyder & Hansen) is reported as causing wilt in Ariz., Colo., La., Md., Miss., N.J., N.Mex., Okla., and Tex.

Gloeosporium piperatum Ell. & Ev., anthracnose, fruit spot and rot, sometimes leaf and stem spot. Mass. to Fla., Tex., and Ill.; P.R. Often referred to Glomerella cingulata as a conid-

Capsicum cont.

ial stage but by some regarded as distinct; perhaps only a non-perithecial race.

Glomerella cingulata (Ston.) Spauld. & Schrenk, fruit rot, anthracnose. Conn. to Fla., Tex., and Kans.; P.R. Also reported as G. piperata (Ston.) Spauld. & Schrenk, which is doubtfully distinct.

Heterodera marioni (Cornu) Goodey, root knot. General in the South from N.J. to Fla., Tex. and Calif.; also N.Y. and Pa.

Macrophomina phaseoli (Maubl.) Ashby, charcoal rot (stems), fruit rot. Calif., Ga., Kans., N.J., Tex.

Macrosporium. See Alternaria and Stemphylium.

Meliola capsicola F.L.Stevens, black mildew. P.R.

Nematospora coryli Pegl., pod spot (? secondary). Fla. Associated with plant-bug injury.

Penicillium spp., internal mold of fruit. Ga.

Peronospora tabacina Adam, downy mildew. Ga., N.&S.Car., Tex. Occurs chiefly in seedbeds.

Phoma destructiva Plowr., Phoma rot (fruit). Ala., Del., Fla., Ga., Miss., N.Y., Pa., S.Car.

Phomopsis capsici (Magnaghi) Sacc. See Diaporthe phaseolorum.

Phyllosticta sp. (? capsici Speg.), leaf spot. Ala., Del., Ga., N.J., Va., W.Va.

Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Tex.

Phytophtora capsici Leonian, Phytophthora blight, fruit rot. Calif., Colo., Fla., La., Mo., N.Mex., N.Y., Ohio, Tex., Va., P.R. Perhaps also in Ind., N.J. reported as P. parasitica

P. parasitica Dast., fruit rot. Ill., Ind.; perhaps also N.J. and N.Y., reported as Phytophthora sp.

Pythium spp., damping off. Cosmopolitan. Usually reported as P. debaryanum Hesse (probably in part P. ultimum Trow) in Conn., La., Mass., N.J., N.Y., N.Car., Tex., P.R.; also fruit rot. P. aphanidermatum (Edson) Fitz. and P. ultimum also reported in Calif.

Rhizoctonia solani Kuehn, damping off, stem and root rot, soil rot of fruit. Cosmopolitan.

Rhizopus sp. (? stolonifer (Ehr. ex Fr.) Lind, black-mold rot of fruit. Fla., Tex., Wash. Occasional in markets.

Sclerotinia sclerotiorum (Lib.) DBy., stem rot, pink-joint, fruit rot. Calif., Conn., Fla., Mass.

Sclerotium rolfsii Sacc., southern blight. N.Car. to Fla. and Tex.; P.R.

Stemphylium botryosum Wallr., seed mold, secondary leaf spot. Conn., Fla.

S. solani Weber, gray leaf spot. Fla.

Verticillium albo-atrum Reinke & Berth., wilt. Calif., Colo., Conn., N.Y., Tex., ? La.

Xanthomonas vesicatoria (Doidge) Dowson, bacterial spot (fruit, stem and leaf), seedling blight. General in the South and

Capsicum cont.
East; also Ill.; Ind., Mass., Mich., Nebr., N.Y., and Wis.

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Ariz., Calif., Ida., N.Mex., Ore., Tex., Wash.
Mosaic -- virus(es). General. In part cucumber mosaic virus (Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm.) various strains, reported especially in Calif., Md., Fla., Ga., Tex., Hawaii; in part tobacco mosaic virus, (Marmor tabaci var. vulgare Holmes, Nicotiana virus 1 K.M.Sm.) reported in Calif., Ill., Ind., Iowa, Md., N.J., N.Y., Okla., Pa., Tex., Hawaii. Infection of peppers by a yellow strain of this virus is reported in Ore. A mosaic disease caused by tobacco etch virus (Marmor erodens Holmes, Nicotiana virus 7 K.M.Sm.) is reported in N.J. and N.Y., and a calico mosaic disease, perhaps caused by potato calico virus (Marmor medicaginis Holmes var. solani Black & Price, Solanum virus 10 K.M.Sm.) is reported in Ga.
Ringspot -- unidentified virus. Colo., Del., Md., N.J., N.Y. Susceptibility to artificial inoculation with potato mottle or ringspot virus (Marmor dubium Holmes), and also tomato ringspot virus (Annulus zonatus Holmes) has been demonstrated.
Spotted wilt -- virus (Lethum australiense Holmes, Lycopersicon virus 3 K.M.Sm.). Calif., Colo., N.Y., Pa., W.Va., Hawaii
Streak -- ? virus (not identified). Tex.

Blossom-end rot -- physiological, attributed to deficient water absorption and excessive transpiration. Chiefly in Southern and Eastern States, occasional in Southwest.
Sunscald -- injury to fruit by thermal and actinic radiation, often following defoliation by leaf diseases. General, especially on bell peppers.

CESTRUM (SOLANACEAE)

See PDR 25: 4-5. 1941

CYPHOMANDRA (SOLANACEAE)

CYPHOMANDRA BETACEA Sendt., TREE-TOMATO. Coarse shrub of S. America grown in warm regions for edible fruit, and sometimes in greenhouses for ornament or novelty.

Corynebacterium michiganense (E.F.Sm.) Jensen, bacterial canker. Calif.
Oidium sp., powdery mildew. Md.

DATURA (SOLANACEAE)

DATURA METELOIDES DC., SACRED DATURA (1). Coarse perennial or annual herb of the Southwestern States, used by Indians for its narcotic properties, a wildlife food plant. D. METEL L., HINDU DATURA (2) and D. STRAMONIUM L., (including D. inermis Jacq. and D. tatula L.), JIMSONWEED (3) are cosmopolitan tropical herbs, the former sometimes grown for ornament; the latter naturalized throughout the U.S., a useful indicator plant in virus research; all contain atropine and similar alkaloids.

Alternaria crassa (Sacc.) Rands, leaf spot, pod blight. Okla., Tex. (1); Fla., Wis. (2); Vt. to Fla., Tex., and Nebr. (3)
A. solani (Ell. & G.Martin) Sor., ? leaf spot. Ill. (3). Often confused with the preceding and in some tests found incapable of infecting this host, but apparently authentic reports also have been made.
Bacterium solanacearum E.F.Sm., bacterial wilt. Ga. (3)
Cercospora daturicola (Speg.) Ray, leaf spot. Okla. (3)
Diplodia atro-caerulea Ell. & Ev., on stems. Ala.
Helminthosporium socium Ell. & Ev., on leaves and stems. Ala., Tex. (3)
Heterodera marioni (Cornu) Goodey, root knot. Hawaii (3)
Phomopsis venenosa (Sacc.) Trav. & Spessa, on stems. N.Y., Pa., S.Car. (3). Also reported as P. daturae (Rolland & Fautr.) Sacc.
Phyllosticta hortorum Speg., leaf spot. W.Va. (3). The name Ascochyta hortorum (Speg.) C.O.Sm. is doubtfully applicable.
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1,3)
Physalospora rhodina (Berk. & Curt.) Cke., on stems. Ala.
Puccinia aristidae Tracy (O,I), rust. Ariz. (1)
Rhizoctonia solani Kuehn, root and stem rot. N.Y., Va., Wis.
Sclerotium rolfsii Sacc., southern blight. Fla. (2,3)
Septoria lycopersici Speg., leaf spot. Md., Tex., Va. (3)
Thielaviopsis basicola (Berk. & Br.) Ferr., root rot. Wis. (2,3)

Mosaic -- virus(es). Fla., Ind., Iowa, N.Y., Wis. The following viruses have been shown to cause systemic infection in (3): cucumber mosaic (Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm.); potato mottle (M. dubium Holmes, Solanum virus 1 K.M.Sm.); tobacco etch (M. erodens Holmes, Nicotiana virus 7 K.M.Sm.); alfalfa mosaic (Marmor medicaginis Holmes) including the potato calico strain (M. m. var. solani Black & Price)
Ringspot -- virus (Annulus zonatus Holmes, Nicotiana virus 13 K.M. Sm.). Ind.
Spotted wilt -- virus (Lethum australiense Holmes, Lycopersicon virus 3 K.M.Sm.). Tex. (1,3)

HYOSCYAMUS (SOLANACEAE)

HYOSCYAMUS NIGER L., HENBANE. Annual or biennial herb of Europe, naturalized in waste ground in the Eastern and Central States; sometimes grown as a drug plant, furnishes food for wildlife.

Alternaria solani (Ell. & G.Martin) Sor., leaf spot. Wis.
Bacterium solanacearum E.F.Sm., bacterial wilt. Ga.

Mosaic -- virus (Marmor tabaci Holmes, Nicotiana virus 1 K.M.Sm.) Va.

LYCIUM (SOLANACEAE)

LYCIUM spp., (a) native shrubs; as L. ANDERSONII A. Gray (1), L. CALIFORNICUM Nutt. (2), L. PALLIDUM Miers (3), DESERT-THORN; and L. CAROLINIANUM Walt., CHRISTMAS BERRY (4). Low shrubs, partly evergreen, typically in dry, saline soils, the first three in the Southwestern States, the latter in the Gulf States; some are of minor forage value, all furnish food for wildlife.

Aecidium lycii Arth. (C,I), rust. Ariz. (3)
Cercospora lycii Ell. & Hals., leaf spot. Okla. (3)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (4)
Puccinia globosipes Pk. (II,III), rust. Ariz., Calif., Nev., Utah (1); Calif. (2); N.Mex. (spp.). O and I unknown.
P. tumidipes Pk. (II,III), rust. Ariz., Colo., N.Mex., Okla., Tex., Utah (3); Tex. (4). O and I produced on L. halimifolium in cultures.

LYCIUM spp., (b) introduced, as L. BARBARUM L. (1), L. CHINENSE Mill. (2), and L. HALIMIFOLIUM Mill. (3), MATRIMONY-VINE. Recumbent or vinelike shrubs of Africa, Asia, or Europe, sometimes grown for ornament, (3) wildely naturalized.

Alternaria sp. (? tenuis Nees ex Cda.), leaf spot. Iowa (3)
Cercospora lycii Ell. & Hals., leaf spot. Iowa (1,3)
Erysiphe polygoni DC., powdery mildew. Minn. (2); Conn., Del., Md., N.J., Pa. (3)
Microsphaera diffusa Cke. & Pk., powdery mildew. Ohio, Pa., Utah (3). Also reported as M. lycii (Lasch) Sacc. & Roum. = M. mougeoti Lév., not authenticated in the U.S. Unidentified powdery mildews (conidial stage) are reported also in Ida., Md., and Wash. (3).
Phyllosticta lycii Ell. & Kell., leaf spot. Ohio (1,3); N.Y. (3)
Puccinia globosipes Pk. (II,III), rust. Pa. (3)

Lycium cont.

P. tumidipes Pk. (II,III), rust. Minn. (2); N.Y. to Ala., Tex., and S.Dak. (3)

Sphaeropsis lycii Dearn. & Barth., on stems. Mo. (3)

Sphaerotheca pannosa (Wallr.) Lév., powdery mildew. Ida., Wash. (3)

LYCOPERSICON (SOLANACEAE)

LYCOPERSICON ESCULENTUM Mill., TOMATO (1). Perennial vine of western S.America but grown as an annual; cult. for fresh fruit throughout the U.S. in gardens and commercially in Tex., Fla. and other Gulf States, and Calif.; for canning and processing chiefly in Calif., N.J., N.Y., Tenn., Mo., Ind., Mich., Md., Ohio, Ill., Ark., Colo., Several botanical vars. are recognized as var. CERASIFORME (Dun.) A.Gray, CHERRY TOMATO (2), var. PYRIFORME (Dun.) Bailey, PEAR T. (3), and are cultivated usually for preserves; L. PIMPINELLIFOLIUM (L.) Mill, CURRANT T. (4), is sometimes grown for ornament. All records pertain to the common tomato unless otherwise indicated.

Agrobacterium rhizogenes (Riker et al.) Conn, hairy root, and A. tumefaciens (E.F.Sm. & Town.) Conn, crown gall. Natural infection of field-grown plants apparently not recorded but the tomato is commonly used as an experimental host especially for crowngall.

Alternaria sp. commonly reported as A. fasciculata (Cke. & Ell.) Jones & Grout (probably = A. tenuis Nees ex Cda.)., black mold, Alternaria rot of fruit (usually after blossom-end rot), secondary leaf spot. Cosmopolitan.

A. solani (Ell. & G.Martin) Sor., collar rot (in part), early blight, Alternaria rot of fruit. General (1,2,3,4) especially in leaf and fruit phases; collar rot phase most frequent in the Southern States and northward to N.Y. and Ill. An arrested state of fruit spot identified as caused by A. solani is reported from Ind.

A. tomato (Cke.) Brinkman (A. tomato (Cke.) Weber), nailhead spot (fruit and stems) Conn. to Fla., Tex., and N.Dak. (1). Much confused with A. solani and A. tenuis. This name, though probably first applied to A. tenuis, must under rules of nomenclature be reserved for the nailhead organism.

Aphanomyces cladogamous Drechs., rootlet necrosis (in greenhouse). Va. (1)

(Apbanobacter michiganense E.F.Sm.): Corynebacterium m.

Ascochyta lycopersici [Plowr.] Brun., leaf spot. Del., Fla., N.J., N.Car., Ore., Va., Wis., P.R. (1). In Europe this is usually referred to Diplodina lycopersici [Cke.] Hollós (conidia) or Didymella lycopersici Klebahn (asci), and has been related,

Lycopersicon cont.

perhaps doubtfully, to Phoma destructiva. Although reported on stems in the U. S. it does not cause a serious stem rot as in Europe.

Aspergillus spp., green and yellow mold, secondary fruit rot. Tex. (1). The following spp. identified: A. flavus Lk., A. luteo-niger (Lutz) Thom & Church, A. nidulans (Eidam) Winter, A. ochraceus Wilhelm, A. tamartii Kita, A. terreus Thom.

Bacterium solanacearum E.F.Sm., bacterial wilt. General in the Eastern, Central and especially the Southern States from Mass. to Ill., Colo., Ariz., and southward (1).

(B. punctulans Bryan): Pseudomonas tomato.

Botryosporium pulchrum Cda,, leaf mold (greenhouse). Pa., Tex. (1)

Botrytis cinerea Pers. ex Fr., gray-mold rot (foliage and fruit), stem rot. Occasional in various localities, north and south, also Calif.; usually after low temperature injury (1,2).

Brachysporium tomato (Ell. & Barth.) Hiroe & Watanabe, fruit rot. Kans., Tex. (1)

Cercospora spp., leaf spot. Ala., Iowa, Kans., Mo., N.J., S.Car., Guam, P.R. (1). Reported as C. canescens Ell. & G.Martin and C. cruenta Sacc., but doubtful; C. diffusa Ell. & Ev. and C. physalidis Ell. are recorded on tomato without localities. C. nicotianae Ell. & Ev. is reported on this host in Tex.

Chaetomium bostrychodes Zopf, leaf and stem mold Tex. (1)

Cladosporium fulvum Cke. (including so-called var. violaceum Plowr.) leaf mold. General on greenhouse crop, occasional on garden and field crops especially in the Eastern and Southern States; (1,2,3). Stem-end rot of fruit attributed to C. fulvum,, and seed transmission, reported in Indiana.

C. herbarum Lk. ex Fr., green-mold rot. Occasional on greenhouse tomatoes, and on field-grown fruit in transit and storage (Calif., Ind., Mass.), especially on green-picked fruit and on yellow varieties (1,2,3)

Colletotrichum atramentarium (Berk. & Br.) Taub., secondary root and stem rot. Pa., Va. (1)

C. phomoides (Sacc.) Chester, anthracnose (chiefly a ripe rot of fruit, sometimes on leaves). General, most frequent in northeastern and north central tomato districts (1). C. dematium (Pers. ex Fr.) Grove is reported as a secondary fruit rot in Tex.

(Corticium solani (Prill. & Del.) Bourd. & Galz.): Pellicularia filamentosa

Corynebacterium michiganense (E.F.Sm.) Jensen, bacterial canker (fruit and stems), birdseye spot (fruit). General; most frequent in the North and West, occasional in the South (1).

Lypersicon cont.

Cuscuta spp., dodder. Calif., Ida., Md., N.Y., Tex. (1). C. campestris Yuncker reported in Calif., C. indecora Choisy in Tex.

Diaporthe phaseolorum (Cke. & Ell.) Sacc., fruit rot. Miss., Tex.

Diplodina lycopersici [Cke.] Hollós. See Ascochyta lycopersici

Diplodia theobromae (Pat.) Nowell, fruit rot (? secondary). Ala. (1)

Erwinia aroideae (Town.) Holland and E. carotovora (L.R.Jones) Holland, bacterial soft rot. Cosmopolitan in transit and markets, especially in green-packed fruit, occasional in fields (1)

? Erysiphe polygoni DC., powdery mildew. On seedlings in greenhouse. N.Car. (1)

Fusarium oxysporum Schlecht. f. lycospersici Sacc. (F. lycopersici (Sacc.) Wr., F. bulbigenum Cke. & Mass. var. lycopersici (Brushi) Wr. & Reinking), Fusarium wilt. General (1,2,3). Fruit rot (wound or secondary) is sometimes attributed to this but is probably due to other forms of F. oxysporum, and to other spp. such as F. avenaceum (Fr.) Sacc., F. equiseti (Cda.) Sacc., F. scirpi Lambotte & Fautr. var. acuminatum (Ell. & Ev.) Wr. (all synonyms of F. roseum Lk. emend. Snyder & Hansen), F. moniliforme Sheld., F. solani (Mart.) App. & Wr. Reported occasionally in transit and markets.

F. retusum Wellman, wilt. Ind. (1)

Glomerella cingulata (Ston.) Spauld.& Schrenk., fruit rot, ? leaf spot. Reported (in conidial stage ?) in Fla., La., Me., Mich., N.J., N.Y. (1); perhaps without discrimination from Colletotrichum phomoides.

Helminthosporium sp., stem canker. Tex. (1)

Heterodera marioni (Cornu) Goodey, root knot. General in field culture in the South including the Middle Atlantic and South Central States, occasional northward, also the Pacific Coast (1,2,3,4)

Isaria clonostachoides Pritchard & Porte (? Clonostachys araucaria Cda. var. rosea Preuss), fruit rot. Va. (1)

Macrophomina phaseoli (Maubl.) Ashby, charcoal rot (stems). Calif., Tex. (1)

Macrosporium. See Alternaria, Pleospora, Stemphylium

Melanconium (on this host). See Myrothecium.

Melanospora interna Tehon & Stout, on stems. Ill. (1)

Mycosphaerella sp., on leaves. S.Car. (1)

Myrothecium sp., stem canker. Tex. (1)

M. roridum Tode ex Fr., ringrot (fruit). Ohio, Tex., Va., Wis. (1)

Nematospora coryli Pegl. (N. lycopersici Schneider), on fruit associated with "cloudy spot". Calif., Fla., Ga. (1)

Nigrospora oryzae (Berk. & Br.) Petch., fruit rot. Calif. (1)

Oidium sp., powdery mildew. P.R. (1)

Olpidium brassicae (Wor.) Dang., on roots. Wis. (1)

Lycopersicon cont.

Oospora lactis (Fres.) Sacc. f. parasitica Pritchard, sour rot, watery rot of fruit. Reported under this name from Ind., Md., Miss., Mo., N.J., Tex., Va. (1), but probably a cosmopolitan saprophyte; common in transit and markets on fruit from the South.

Orobanche ludoviciana Nutt., broomrape (parasitic on roots. Wyo. (1). O. ramosa L., Calif. (1)

Pellicularia filamentosa (Pat.) Rogers (Rhizoctonia solani Kuehn), damping off, collar rot, stem canker, soil rot (fruit). Cosmopolitan (1,2,3)

Peronospora tabacina Adam, downy mildew. Ga., N. & S. Car. (1)

Pestalotia sp., fruit rot. Tex. (1)

Phoma destructiva Plowr., Phoma rot (fruit), black spot (fruit, stems & leaves). Nearly general, especially in the South, but not yet reported from the North Central States (1)

P. terrestris Hansen, secondary root rot. Ill., Iowa, N.J. (1)

Phomopsis sp., fruit rot. See Diaporthe phaseolorum.

Phyllosticta hortorum Speg. (? Ascochyta lycopersici Brun.), leaf spot. N.Y. (1). This has been referred to Ascochyta as A. hortorum (Speg.) C. O. Sm., but it has been questioned whether the American fungus conforms to P. hortorum.

(P. lycopersici Pk.): Phoma destructiva

Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Okla., Tex. (1,2,3).

Phytophthora cactorum (Leb. & Cohn) Schroet., stem rot, fruit rot. (buckeye rot, in part). N.Y., Pa., Wis. (1)

P. infestans (Mont.) DBy., late blight, fruit rot. General in humid regions and seasons; most frequent in the East and Southeast, occasional in Central and Pacific States (1,2,3)

P. parasitica Dast. (P. terrestris Sherb.), buckeye rot (fruit), stem rot. Mass. to Fla., Tex., and Ill.; Ariz., Calif., P.R. (1). Other spp. causing a similar rot are P. capsici Leonian, in Calif. and Colo.; P. cryptogaea Pethybr. & Laf. in Ill. and N.H.; P. drechsleri Tucker in Calif.

Plectospira myriandra Drechs., rootlet necrosis. Va. (1)

Pleospora lycopersici El. & Em. Marchal (=P. herbarum (Pers. ex Fr.) Rabh. ?), fruit rot. Calif. (1)

Pratylenchus pratensis (De Man) Filip., root necrosis. Md. (1)

Pseudomonas tomato (Okabe) Magrou. bacterial speck. Occasional in Middle Atlantic, Southeastern, and Central States, also Calif., Okla., Tex. (1)

Pullularia pullulans (DBy.) Berkhout, fruit spot. W.Va. (1)

Pythium spp., damping off, collar rot, occasional fruit rot (soil rot). Cosmopolitan (1,2,3). Commonly reported as P. debaryanum Hesse, especially in northeastern and north central districts, and P. ultimum Trow in Calif., Colo., Md., N.Y., Ohio; also P. aphanidermatum (Edson) Fitz., damping off, Okla.; P. myriotylum Drechs., rootlet rot, S.Car.; P. salpingophorum

Lycopersicon cont.

Drechs. and P. megalacanthum DBy., root rot. Calif.

Rhizoctonia solani Kuehn. See Pellicularia filamentosa.

Rhizopus stolonifer (Ehr. ex Fr.) Lind (R. nigricans Ehr.), Rhizopus rot, ripe rot. Cosmopolitan in transit and markets; sometimes in fields (1). Also reported causing stem blight following fruit rot in Calif.

Sclerotinia sp., blossom blight. Calif., Fla., N.Y., Ohio (1)

S. minor Jagger, fruit rot. Tex. (1)

S. sclerotiorum (Lib.) DBy., stem rot, fruit rot ("timber rot"). Occasional in greenhouses, also in fields in the Southern States.

Sclerotium bataticola Taub. See Macrophomina phaseoli

S. rolfsii Sacc., southern blight. Va. to Fla., Tex., and Kans.; also Calif. and P.R.; occasionally in the North (Ind., Md., N.J.) on southern-grown plants (1)

Septoria lycopersici Speg., leaf spot. General except the Pacific Northwest (1,2,3,4)

Spongospora subterranea (Wallr.) Lagh., powdery scab (on roots). Pa. (1)

Sporotrichum sp., fruit rot. Ind., Tex. (1)

Stemphylium sp. (? S botryosum Wallr.) leaf and fruit spot. Calif., Del., Ind., S.Car. (1). See also Pleospora lycopersici of which this is probably the conidial stage.

S. solani Weber, gray leaf spot. Fla., Ga., La., N.J., N.&S.Car., Tenn., Tex., Va. (1)

Synchytrium endobioticum (Schilb.) Perc., wart. Pa. (1)

Thielaviopsis basicola (Berk. & Br.) Ferr., root rot. Tex. (1)

Trichothecium roseum Cda., fruit rot. Md., Ohio (1)

Verticillium albo-atrum Reinke & Berth., Verticillium wilt. Occasional in all regions, especially the Pacific and Northeastern States, sometimes the North Central (Ill., Iowa, Ohio, Wis.), Southern (Fla., Miss., Tex.), and Western (Colo., Utah) States (1,2,3). The form or sp. known as V. dahliae Klebahn is reported in Calif., Miss., and Ohio. Stem canker attributed to V. albo-atrum is reported in Calif.

V. lycopersici Pritchard & Porte, collar rot (in seed beds). Colo., Del., Ill., Md., N.J., S.Car. (1). Probably a form of the preceding.

Xanthomonas vesicatoria (Doidge) Dowson, bacterial spot (fruit and leaves), sometimes stem cankers. Northeastern, Central, and Southern States; rare or absent in the West but reported from Kans., Nebr., N.&S.Dak., Ore. (1)

Big bud -- virus (? Galla australiensis Holmes, Lycopersicon virus 5 K.M.Sm.; ? Chlorogenus vaccinii Holmes, Vaccinium virus 1 K.M.Sm.). Calif., Wash. (1). These viruses may be identical or closely related strains; the latter has not been identified in natural infections of this host but is inoculable to tomato.

Lycopersicon cont.

Bunchy top -- unidentified virus. Tex.

Bushy stunt -- virus. Marmor dodecahedron Holmes, Lycopersicon virus 4 K.M.Sm.). Used in experiments in N.J., natural occurrence not reported.

Curly top (western yellow blight) -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Western States from N.Dak. to Tex., Calif., and Wash. (1,2,3,4).

Dieback streak. See Tip blight and Spotted wilt.

Fern-leaf -- virus. Typically caused by a distorting strain (M. tabaci var. deformans Holmes, Nicotiana virus 1A K.M.Sm.) of tobacco mosaic virus. Occasional in greenhouses (1). Sometimes applied to a similar disease caused by cucumber mosaic virus, better known as shoestring, q.v.

Leafroll -- ? virus. This disease as ordinarily observed in tomato is of physiological origin, but virus leafroll is reported in Tex., and potato leafroll virus (Corium solani Holmes, Solanum virus 14 K.M.Sm.) is communicable to tomato.

Mosaic -- virus (es), commonly tobacco mosaic virus (Marmor tabaci Holmes, Nicotiana virus 1 K.M.Sm.), less frequently cucumber mosaic virus (M. cucumeris Holmes, Cucumis virus 1 K.M.Sm.); sometimes both. General (1,2,3). Some severe types of mosaic may be due to tobacco etch virus (Marmor erodens Holmes, Nicotiana virus 7 K.M.Sm.), reported in Ky. Yellow (aucuba) mosaic, caused by yellow strains of tobacco mosaic virus (M. tabaci var. aucuba Holmes, Nicotiana virus 10 K.M.Sm.) occurs on fruit and foliage, is less frequent than the typical form. Mild types may be caused by the potato mottle virus (Marmor dubium Holmes, Solanum virus 1 K.M.Sm.), but natural infection with this virus is reported only in combination with other viruses, causing streak. A leaf-withering strain of this virus (M. tabaci var. siccans Doolittle & Beecher) is reported in Md. and Va. Systemic infection of tomato from artificial inoculation with the viruses of celery calico (Apium virus 2 K.M.Sm.), potato severe mosaic (M. cucumeris var. upsilon Holmes, Solanum virus 2 K.M.Sm.) and potato calico (Marmor medicaginis Holmes var. solani Black & Price, Solanum virus 10 K.M.Sm.) has been demonstrated. Natural infection with celery calico virus has been reported in Calif.

Ringspot -- virus (Annulus zonatus Holmes, Nicotiana virus 13 K.M.Sm.). Colo., Ind., Wyo.; ? N.Y. (1)

Shoestring (filiform leaf) -- virus (Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm.). Occasional in fields in all sections (1)

Spotted wilt -- virus (Lethum australiense Holmes, Lycopersicon virus 3 K.M.Sm.). Pacific States and Colo., Ida., Utah, Tex. in fields; occasional in Eastern and Central States (Ill., Mich., Miss., Mo., N.Y., Ohio, Pa., West Va., Wis.), mostly in greenhouses (1). Tip blight, caused by a strain (L. austral-

Lycopersicon cont.

iense var. lethale Holmes) of this virus, is reported in Calif., Md., Ore., Tex., Utah, W. Va. (1)

Streak (winter blight) -- virus(es). Double-virus or complex streak, caused by potato mottle or latent virus (Marmor dubium Holmes, Solanum virus 1 K.M.Sm., various strains) together with tobacco mosaic virus (M. tabaci Holmes, Nicotiana virus 1 K.M.Sm.) has been reported widely in greenhouses (Eastern, Central, Pacific, occasionally the Southern States) where potatoes or potato-virus-carrying weeds grow in proximity to tomatoes; field infections from contaminated greenhouse and volunteer plants also occur. Other tobacco viruses, as etch (M. erodens Holmes, Nicotiana virus 7 K.M.Sm.), reported in Ky., may be a component of this complex. Single- virus streak, caused by a necrotic strain (M. tabaci var. canadense Holmes) of tobacco mosaic virus, occurs occasionally in greenhouses; also reported in fields (Ind., Ky., Okla.)

Tip blight. See spotted wilt.

Western yellow blight. See Curly top.

Winter blight. See Streak.

Witches' broom -- unidentified virus (? Chlorogenus solani Holmes, Solanum virus 15 K.M.Sm.). Tex. (1)

Yellows -- virus (Chlorogenus callistephi Holmes, Callistephus virus 1 K.M.Sm.). Ill., Ind., N.Y., Tex. (1)

Blossom-end rot -- physiological, attributed to unbalanced moisture supply in relation to transpiration, perhaps also influenced by calcium deficiency. General (1,2,3,4)

Blotchy ripening -- fruit defect attributed to malnutrition, perhaps potassium deficiency. Ind., Mich., N.Y., Tex., Wash. (1)

"Bull plant" -- See Fasciation

Catface -- fruit abnormalities attributed to various unknown growth disturbances, in part climatic. Occasional anywhere (1)

Center (core) rot -- internal necrosis of fruit of undetermined cause, but probably sometimes a phase of blossom-end rot; various organisms (bacteria and fungi, sometimes viruses, associated). Ind., Md., N.J., Ore., Tex., Va. (1)

Cloudy spot -- fruit blemish attributed to feeding punctures by plant bugs. Del., Fla., Ind., Kans., Miss., N.Y., Ohio. (1)

Fasciation -- cause not determined, probably a genetic growth abnormality or sometimes excessive or unbalanced nutrition. "Bull plant" -- excessive vegetative vigor accompanied by barrenness -- is probably a related abnormality. Both conditions occasional anywhere.

Ghost spot -- fruit blemish of unknown cause. Occasional in greenhouses and in fields in the Gulf, Central and Eastern States, also Calif.

Lycopersicon cont.

Hollow stem (hollow-stem wilt) -- cause not determined (Ind.); attributed to lightning injury (Ill., Wis.); to fertilizer injury (Ark., N.J.)

Oedema -- leaf hypertrophy induced by excessive water absorption and reduced transpiration. Occasional in greenhouses, sometimes in fields. See leafroll.

Leafroll (curl) -- physiological, associated with excessive soil moisture, and with starch congestion in leaves following heavy pruning. General (1)

Pockets (puffing) -- fruit defect attributed to environmental or nutritional factors that adversely affect pollination and growth. Occasional in greenhouses; sometimes in fields especially on the winter and early spring crops in the Gulf States.

Pox (pitting) -- fruit blemish of unknown cause chiefly on greenwrap fruit. Ala., Ark., Calif., Fla., Ill., Pa., Tex., Wis., P.R.

Psyllid yellows -- toxemia induced by feeding of the insect, Paratrioza cockerelli (Sulc). Ariz., Calif., Colo., Nebr., N.Mex., S.Dak., Tex., Utah, Wyo. (1)

Red ring -- stem injury by the insect, Cyrtopeltis varians (Dist.) Ariz., S.Car., Tex. (1)

Russetting -- leaf injury by mites, Phyllocopter destructor. Ariz., Colo. (1)

Sunscald -- fruit injury by heat and actinic rays, especially on plants defoliated by disease. General (1)

Top necrosis -- deformity and necrosis of shoot apex induced by mites, Tarsonemus sp. N.Y. (1)

Walnut wilt -- toxemia induced by root excretions of walnut trees (Juglans nigra). Mich., N.J., Pa., Va. (1)

DIVISION OF MYCOLOGY AND DISEASE SURVEY

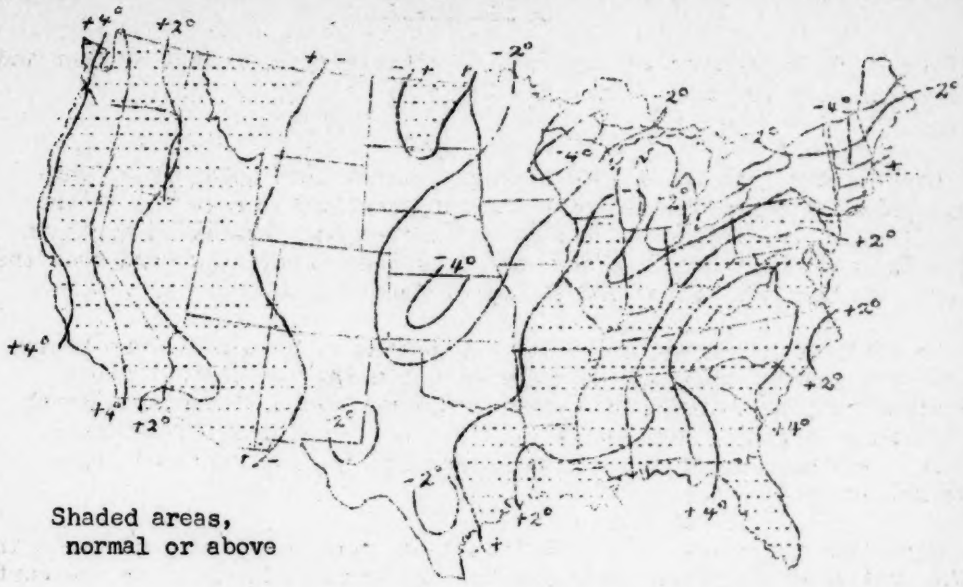
APRIL WEATHER

(From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for week ending May 6, 1947)

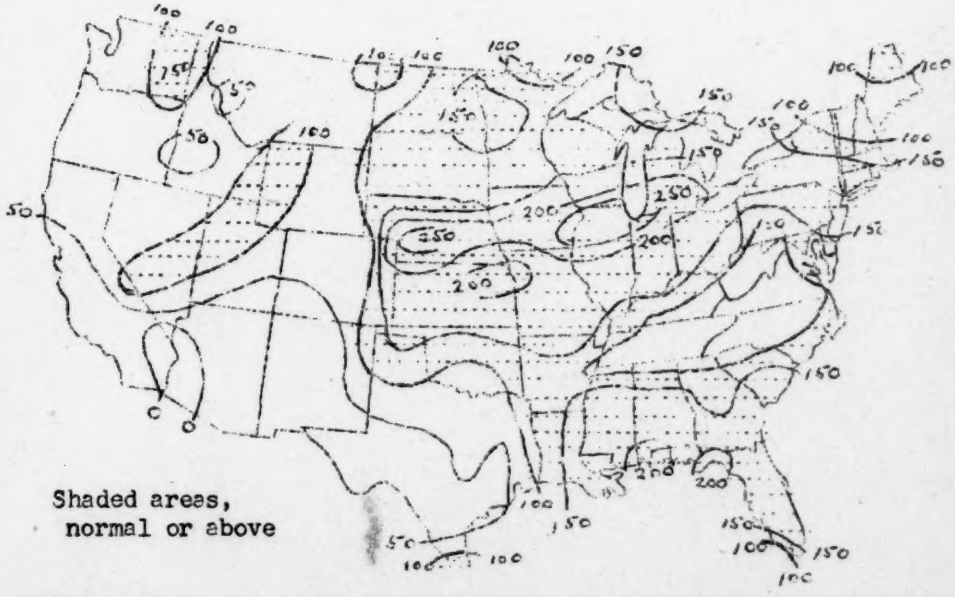
Map I shows that April 1947 averaged warmer than usual from Pennsylvania southward to the south Atlantic and Gulf coasts and in the Pacific States, while it was somewhat cooler than normal in northern New England, northern New York, and from Kansas northeastward over the upper Mississippi Valley and the upper Lake region.

Precipitation during April 1947, as presented by Map II, was heavy over the eastern half of the country, including the central Great Plains, but excluding much of northern New England, Tennessee, North Carolina, Virginia, and West Virginia. A few sections of Nevada, Utah, Wyoming, Montana, and eastern Washington also reported above normal amounts.

More than twice the usual precipitation occurred at many stations in the area from Kansas and Nebraska to southern Michigan and on the east-central Gulf coast, while less than half the usual amount fell in most of California, Arizona, New Mexico, and much of Texas.



Map I. Departure of mean temperature from normal, April 1947



Map II. Percentage of normal precipitation, April 1947

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